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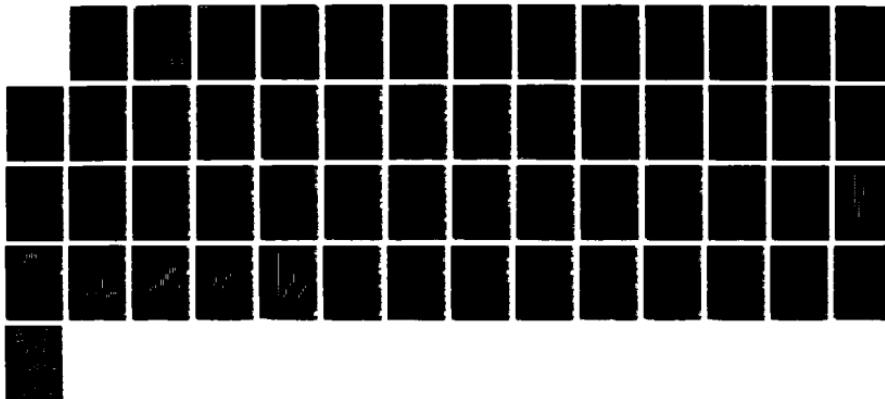
A STUDY TO DETERMINE THE OPTIMAL OCCUPANCY SCHEDULE FOR 171
THE NEW OUTPATIENT. (U) ARMY HEALTH CARE STUDIES AND
CLINICAL INVESTIGATION ACTIVITY F.. K G WASHBURN

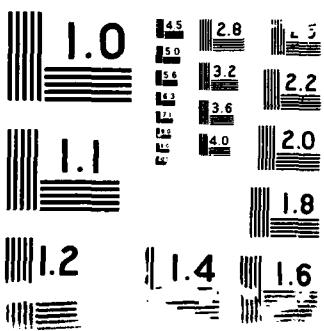
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A STUDY TO DETERMINE THE OPTIMAL
OCCUPANCY SCHEDULE FOR THE NEW OUTPATIENT
ADDITION TO IRWIN ARMY HOSPITAL

A Problem Solving Project
Submitted to the Faculty of
Baylor University
In Partial Fulfillment of the
Requirements for the Degree
of
Master of Health Care Administration

Major Kent G. Washburn, MSC

June 1979

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TABLE OF CONTENTS

ACKNOWLEDGEMENTSi
LIST OF TABLESiii
Chapter	
I. INTRODUCTIONp. 1
Conditions Which Prompted the Study . . . . .	.p. 3
Statement of the Problem . . . . .	.p. 6
Objectives . . . . .	.p. 6
Criteria . . . . .	.p. 7
Limitations . . . . .	.p. 8
Assumptions . . . . .	.p. 9
Review of the Literature . . . . .	.p. 9
Problem Solving Methodology . . . . .	.p. 15
Footnotes . . . . .	.p. 17
II. DISCUSSION . . . . .	.p. 19
Relocation of Clinics, Services and Functions . . . . .	.p. 20
Table I . . . . .	.p. 22
Determination of Relocation Priorities . . . . .	.p. 21
Table II . . . . .	.p. 25
Relocation of Equipment and Supplies . . . . .	.p. 24
Additional Staffing and Equipment . . . . .	.p. 27
Time Limitations . . . . .	.p. 28
Stormont-Vail Regional Medical Center Expansion . . . . .	.p. 28
Two Alternate Relocation Plans . . . . .	.p. 30
Table III . . . . .	.p. 31
Table IV . . . . .	.p. 33
Footnotes . . . . .	.p. 36
III. CONCLUSION . . . . .	.p. 39
IV. RECOMMENDATIONS . . . . .	.p. 41
BIBLIOGRAPHY . . . . .	.p. 42

LIST OF TABLES

TABLE I	Clinics, Services and Functions Relocation Priorities. . . p. 22
	<ul style="list-style-type: none"> a) Clinic or Service b) Location in Existing Hospital Facility c) Relocation Site in Clinic Addition d) Priority II
TABLE II	Definitions of Priority Classifications. p. 25
	<ul style="list-style-type: none"> a) Priority Number b) Definition
TABLE III	Clinics, Services and Functions Relocation Time. p. 31
TABLE IV	Master Timetable for Relocation. p. 33
	<ul style="list-style-type: none"> a) Days 1 through 15 b) Days 16 through 30 c) Days 31 through 45

CHAPTER I

INTRODUCTION

Irwin Army Hospital, Fort Riley, Kansas was completed as a 250 bed hospital in 1957. The daily clinical workload increased by over 150% from fiscal year 1966 to fiscal year 1972.¹ This increase in outpatient workload was due primarily to changes in the delivery of health care that greatly expanded the use of the outpatient facilities. By that time, the main hospital facility did not meet the electrical, air conditioning, ventilation, air vacuum, oxygen, and fire safety system standards of the Joint Commission on Accreditation of Hospitals. Various medical, surgical, dental and other specialty outpatient clinics were not provided or were housed in World War II buildings in the Whitside area. These buildings were unsuitable for continued use as part of the hospital complex because of their scattered location, deteriorated condition, inadequate space and demoralizing appearance and interior atmosphere.

In fiscal year 1975 a major construction project was approved for Irwin Army Hospital. The construction was required to provide a complete, permanent, medical facility at Fort Riley. The final design concept

included a clinic addition of 185,000 square feet to the existing hospital of matching construction that would meet the, then current, structural, electrical, ventilation, heating, air conditioning, fire safety and communication standard of the Joint Commission on Accreditation of Hospitals. Additionally, the concept design provided for an electrical, mechanical and fire safety system upgrade for the existing Irwin Army Hospital structure. Additionally, 660 parking spaces and a new and expanded boiler plant were included.

The proposed addition to Irwin Army Hospital was a three story clinic addition with a fourth floor to house the mechanical equipment. All ancillary departments were programmed to expand whereas the bed areas were to remain the same. To accomplish this end, some departments were to be expanded into existing space while others would be completely relocated into the new construction area. Future expansion of Irwin Army Hospital was not contemplated by the Office of the Surgeon General;² therefore, additional capacity for later expansion was not provided in the design of the structure.

The basement floor of the new clinic addition was designed to house physical exam, psychiatric, social and mental hygiene, part of the patient services, central materiel supply, pharmacy, supply and service, and the receiving/shipping dock. New facilities included in the patient services area were a coffee shop, post exchange, volunteer area and offices for social and Red Cross workers. The facilities

designed for the first floor level were general outpatient to include the emergency room, clinical laboratory/pathology, the department of medicine, physical therapy, orthopedic clinic, first floor registrar activities, department of hospital clinics, radiology, and the dispensing pharmacy. The EENT clinic, occupational therapy, administration, second floor registrar activities, nursing service administration, the department of hospital clinics, chapel, medical library and central appointments were located on the second floor. The third floor housed only the mechanical room for the ventilation equipment and an elevator lobby.

Conditions Which Prompted the Study

The scheduling of the construction was divided into Phase I construction and Phase II construction - remodeling of existing facilities. The construction and particularly the upgrading of the existing hospital has had a major impact on the hospital routine especially for the nursing units. "The Surgeon General's Office has indicated that clinics, where remodeling must occur, can be temporarily moved to off-site quarters, without a loss in effectiveness or convenience."³ It was planned that inpatients would be moved from one unit to another when necessary. In terms of both time and economy, Phase II - remodeling will be expedited by allowing the contractor to demolish or wipe clean an area. This implied a relocation of as many clinics as possible in order to maximize the construction area.

The Phase I construction was to provide a relocation of the Emergency Department off-site to the old hospital quarters, eg. the Whitside area

and to provide new construction for the boiler plant and the four floors of the new outpatient clinic addition. As a result of a local command decision, the emergency department was not located off-site but relocated within the existing facility. As the new construction progressed it was plagued by one delay after another.

Part A of the Phase II construction - remodeling of existing facilities, was designed to:

1. Relocate the surgical suite and recovery room functions off-site to the old hospital complex and to include as many surgical beds as required or possible.
2. Relocate the hospital dental clinic to an off-site location.
3. Relocate the OB/GYN and pediatric clinics opposite to the old hospital complex.
4. Relocate the command and administration temporarily to the second floor of the new construction in the administrative area.
5. Relocate the medical and surgical clinics off-site.
6. Remodel the basement, first floor, and second floor operating room suite of the existing hospital to provide an upgrade or new functional space that meets the standards of the Joint Commission on Accreditation of Hospitals.
7. Construct two floors of new stair towers.
8. Construct the base and first floor of the seismic shear walls.

Part B was to include the remodeling and upgrade of the remainder of the existing hospital to include the completion of the stair towers and seismic shear walls.

Completion of the new construction was continually delayed and

eventually was completed some eighteen months behind schedule. The contract with the prime contractor provided for only a thirty day period⁴ between the final acceptance of the new outpatient clinic addition and turning over the basement, first floor, and the second floor operating room area of the existing hospital to the contractor's for renovation. Included in the January 31, 1973, Military Construction Project Data, DD Form 1391, as part of the basic justification was ". . . housed in World War II buildings. The buildings are unsuitable for use as part of the hospital complex because of their scattered location, deteriorated condition, inadequate space and demoralizing appearance and interior atmosphere."⁵ Since then, the local post engineers have provided virtually no engineer support or maintenance and no improvements of the World War II building in the Whitside area pending their programmed demolition.

The utilization of Whitside had been circumvented in Phase I by relocating the Emergency Department within the existing facility. The design concept in Phase II, Part A, provided for a remodeling of the dining, kitchen, and dietary storage areas but no alternate site was specified. This resident's first quarter's management project addressed that oversight and recommended an off-site preparation with a diversion of first floor space from physical therapy in the new addition to be used as the staff dining facility.⁶ The problem solving project of the previous administrative resident, Major Sterling D. Hammond, recommended a location on the third floor of the existing hospital, formerly occupied by the labor and delivery suite.⁷ The labor and delivery suite was moved to

new quarters on the fifth floor of the existing hospital in the fall of 1979 in preparation for the subsequent moves associated with occupying the new clinic addition.

The deteriorated conditions of the World War II buildings in the Whitside area did not allow for the relocation, even on a temporary basis, of clinics, services, and functions which existed in the existing hospital. The maximum number of outpatient clinics located in the Whitside area needed to be consolidated in the new outpatient clinic addition for the same reasons.

Statement of the Problem

The problem was to determine the optimum occupancy for the new outpatient addition to Irwin Army Hospital.

Objectives

This study was precipitated by the knowledge that the conceptual design for relocation during Phase II, Part A, of the construction was inadequate and would substantially interfere with the delivery of patient care at Irwin Army Hospital, Fort Riley, Kansas. Any relocation would have obvious impact on the amount and quality of care rendered therein. The objective of this study was to ensure that outpatient care could be conducted at Irwin Army Hospital throughout the relocation period without incurring substantial costs or interruption of any outpatient service for more than twelve hours or adding unnecessarily to patient discomfort. Intermediate objectives were:

1. Identify existing locations of clinics, services, or functions

relocating to the new outpatient clinic addition.

2. Determine a priority of movement by class of the activity.
3. Determine which types of equipment and supplies that will be pre-positioned in the new addition, moved to the addition, or turned in from their existing location.
4. Determine additional staffing and equipment requirements.
5. Analyze the impact of delaying turning the basement, first floor, and the second floor operation area over to the contractor.
6. Compare the relocation of services at a civilian health care institution, Stormont-Vail Regional Medical Center, Topeka, Kansas to identify applicability to the Irwin Army schedule.
7. Identify procedures and techniques utilized by other medical treatment facilities which, if applied, would reduce the adverse impact of the relocation.
8. Develop, compare and evaluate alternative methodologies for occupying the new clinic addition.
9. Develop a recommended schedule for relocation based upon the above analysis.

Criteria

Criteria were derived from current literature, command guidance and management decisions. Relocation schedules that involve a reduction in the existing level of services by more than one-third for more than seventy-two hours or an interruption or cessation of services for more than twelve hours were deemed unacceptable to the command. The command had set a higher priority for being continuously operational than on

continuing the existing volume of services. The utilization of self help and overtime by military personnel were desired above the payment of overtime for civilian personnel. The occupancy of one floor at a time would minimize the appearance of disruption to outside observers to include outpatients. This was considered desirable but a low priority.

Limitations

A number of limitations have been placed upon this study. First, the study must be completed thirty days before the first day of any relocation schedule in order to allow for briefings of the hospital's staff, to hire any required temporary personnel, and to coordinate for Post support. Second, alternative schedules for relocation cannot involve contract modification, incur additional expense, or cause a delay in the implementation of Phase II, Part A; therefore, any relocation schedule involving clinics, services, or functions in the basement, first floor, second floor, or the operating room area must be completed in 30 days. The thirty day period of time is to start at the time of the final acceptance of the new addition, plus all relocations accomplished within the maximum of forty-five days in order to minimize the turmoil on the institution. Third, budget and manpower limitation restrict the number of temporary employees to support the relocation to no more than five. Fourth, the maximum number of vehicles available for a 30 to 45 day period from the Post transportation motor pool are four; 2 1/2 ton trucks with driver, one; 1 1/2 ton truck, and a forklift. Fifth, all military detail personnel would have to come from MEDDAC/DENTAC resources. The United States Retraining Brigade does

not provide detail personnel in that all their personnel are undergoing continuous training and the First Infantry Division was anticipated to be in Europe for the Reforger '79 exercise during the relocation period.

Assumptions

It was assumed that Phase I of the construction would be completed on February 1, 1979.

It was assumed that five temporary hires could have been readily obtained from the surrounding civilian communities to work in support of the relocation for a period of 120 days.

It was assumed that there would be no significant staffing changes at Irwin Army Hospital during the period of the relocation.

It was assumed that the warehouse entrance and loading dock to the new addition would be utilized as an equipment staging area and would not be available as a point of entry or egress for the relocating elements.

Review of the Literature

A literature review was accomplished to ascertain the applicability of the criteria established for judging the relocation. Literature prior to 1975 was not reviewed in order to maintain an emphasis on current philosophies existing within the health care field. Generally, the literature re-examined organizational structures for managing moves or relocations and was of the after action reports type.

The 1976 move of the San Francisco General Hospital to a nearby facility included the transfer of 80 hospital units, 24000 pieces of

furniture and equipment, 2100 staff members, and 300 patients. A central team was responsible for assigning detailed tasks to individual department and staff members. In comparing alternative plans for the move, the critical path scheduling technique was helpful. Factors included in the study were size and type of patient services, the layout and design of the old and new facilities, the access and the distance to the new facility, the availability of funds for purchasing equipment and hiring commercial movers, the availability of volunteer resources, and the optimal timing for the move. Their supply units moved in ten days; the dietary, medical records, clinical department moved in three days; specialty laboratories in two days; and the offices in ten days. To insure continuity of care, emergency functions were staffed in both locales for 24 hours. The move of the non-emergency services was accomplished in 26 days on a self-help basis augmented with additional employees who were hired for the move period.

A commercial firm was not utilized in the San Francisco General Hospital move because it was contended that the hospital was unique and not comparable to a large office building because of the patients, narcotics, medical records, medical equipment, and other special care items.⁸ The literature is conflicting on the point, whether a hospital can be moved by commercial vendors who have experience in moving large office buildings. The position that a hospital can be moved by a commercial mover will be discussed later in this literature review.

The planning cycle for moving the Mount Sinai Medical Center, New York City, to the 31 story Annenberg Building covered a three year span.⁹

They first obtained occupancy priorities and timetables that reflected the top administration's preferences. The project coordinating task force committee was multidisciplinary plus with representation from the departments of purchasing, receiving, engineering, building services, communications, and security which had crucial start-up tasks to perform. Due to the differences in civilian hospital organization, there was a greater involvement of those types of personnel than are found in the military health care environment. The Corps of Engineers, facility or Post engineers, and the Project Offices of the Health Facilities Planning Agency of the Office of the Surgeon General insure that those crucial start-up tasks are accomplished before a facility is turned over to the on-site personnel for occupancy.

Occupying each floor of the Annenberg Building was approached as a separate sub-project correlating with the phasing of the construction schedule. Each area had projected objectives and deadlines associated with the turnover date, the post-turnover set-up period, and the target occupancy date. The turnover date was the date that the contractor predicted the completion of the major construction, qualitative inspections were completed, and the building accepted by the hospital for equipping and furnishing. The post-turnover set-up period included the installation of new not-in-contract equipment, fixtures, and furniture and for the installation of communications equipment. At Irwin Army Hospital the communications equipment had been included as contractor installed equipment. The target occupancy dates predicted the period for physical relocation. A master occupancy schedule was developed, but highly complex network techniques, PERT/CDM, were avoided.¹⁰

In the Mount Siani relocation six categories of equipment were analyzed in developing their time tabs; fixed; built-in furniture or fixtures; large or heavy, moveable furniture and technical equipment requiring minor installation, hook-up, and adjustment (desks, filing cabinets, refrigerators); miscellaneous furnishings and fixtures (ash urns and wastebaskets); small, portable pieces of expensive or sensitive, scientific or office equipment (typewriters and microscopes); and new pre-stocked supplies. Factors used in evaluating equipment installation options included unloading areas, moving routes, freight elevators, installation methods, and work hours.

Departmental moves were evaluated on down time, specific times when ongoing departments would be least disrupted, preferred moving phases, staffing of both old and new and the minimum levels of equipment, utility services, and built-in systems required¹¹ for effective operation in the new area. This minimum level was also found to be a primary concern in moving the Intensive Care Unit at Stormont-Vail. It was observed that once an area has reached its minimal acceptable level of equipment, it can be occupied and become a revenue producing area. That criteria appears to be more crucial in the civilian environment than in the military.

Current literature can be divided into two basic categories; one, aimed primarily as public relations or educational for the population served and the other a more technical after-action report, emphasizing the organizational structure for the relocation and analyzing the priorities

assigned to criteria used in the decision process. "Bellevue's Move - It Approximates the Relocation of a Small City"¹² was typical of the public relations type and emphasized the human aspects of the transfer in six weeks of all bedfast patients, 45,000 pieces of new equipment, 3,500 existing items, and more than 50 clinical and service units. Also included, was reference to a "patient move coordinator" who provided minute-by-minute direction of the operation via two-way radio communication. The role of the infection control team¹³ played in evaluating the same Bellevue Hospital Center move in the spring of 1975 for potential infection hazards before patient occupancy was reported in the September issue of "Hospitals". This typifies the after-the-fact report on how a relocation was accomplished.

The relocation being studied in this problem solving project does not include the relocation of any bed patients. Criteria utilized in evaluating bed patient moves would include duplication of services at both the old and new locations, the mode of transport of the patients, and the need for increased personnel to operate the new or the new and old duplicate systems.¹⁴

The literature review included an article on the relocation of the Naval Regional Medical Center, Newport, Rhode Island in May, 1974.¹⁵ A multidisciplinary committee planned the move with the objective of minimal disruption of patient services both during moving and in the initial operation with the new facility. Program Evaluation and Review Technique (PERT) was used in enumerating each event to be accomplished and putting

them in order. Time values were designated and a "critical path" indicated. Spread sheets were utilized to control the coordination of the installation of equipment and supplies. The availability of the medical records and central appointment services were given particular emphasis. A single individual was given overall responsibility and placed in charge of the relocation. At Irwin Army Hospital, the overall responsibility of the relocation was assigned to the Nursing Methods Analyst.

The occupancy of the new 496-bed Louisville Medical Center involved the merger of patients, personnel, and equipment from the Norton Memorial Infirmary, a 307-bed adult hospital and Children's Hospital, a 139-bed facility. An effective organization, written plans, choice of movers, publicity, and review of details helped make a successful move. Although commercial movers were not considered for the relocation at Irwin Army Hospital due to financial constraints, a literature review would be incomplete without a discussion of the use of commercial movers. The advantages of commercial movers are 1) consultation and advice based on experience in moving large organizations and 2) supervision of the personnel who perform the move.¹⁶ Criteria for the evaluation of commercial movers should include professional experience, quality of management and the strength of supervision, accountability, and satisfaction of other firms that have used the movers. It is not necessary to choose a company that has had experience moving offices or firms that approximate the size of the hospital to be moved.¹⁷

A review of the literature was utilized in formulating the criteria upon which alternative movement or relocation plans at Irwin Army Hospital were judged. Command imposed constraints appeared realistic and rather liberal in the light of the experiences reported in the literature.

Problem Solving Methodology

The Whitside area and the basement, first floor, and the operating room area were surveyed to determine those clinics, departments and services to be affected. This information was provided to the Nursing Methods Analyst who assigned areas for each in the new clinic addition. The Nursing Methods Analyst was locally responsible for space allocation and utilization in the outpatient clinic addition.

Each clinic, department, and services chief was interviewed to determine the amount of time required to relocate their respective functions. This was not a highly complex or scientific method of determining the amount of time required to relocate, but it was in keeping with contemporary practices, incorporated middle management early in the planning process and helped fix the supervisor's responsibility for that portion of the relocation. Involvement of the supervisor was consistently recommended in the literature.

An analysis was made of the equipment requirements and how they would be met. A determination of the support available to move in or pre-position equipment was made.

A significant limitation on this relocation was the 30-day period in which to vacate and release to the contractor the basement, first floor, and operating room of the existing hospital. Although recognized

as a limitation, it was analyzed as to the potential for extending that time frame and the associated costs of such a course of action.

Alternate courses of action were developed and compared to the criteria to determine the best course of action. A critical path of activities and their corresponding deadlines was developed relative to the turnover date, and a recommended schedule of events delineated.

The local Project Officer from the Office of the Surgeon General and the Nursing Methods Analyst at Irwin Army Hospital served as crucial resource personnel. The IBM System 6 in the Project Office with its historical records of equipment purchase and delivery information was utilized in the analysis of the equipment involved in the relocation.

FOOTNOTES

1. Department of Defense Form 1391, Military Construction Project Data, dated 31 January 1973.
2. United States Army Corps of Engineers. Concept Design: Irwin Army Hospital, Fort Riley, Kansas, FY 75 MCA 225, Volume 1, Additions and Alterations, (by Ellerbe), (June, 1974). pp 1-9.
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4. The Additions and Alterations Project, Irwin Army Hospital, MCA, Contract Number DACA 45-75-C-0259.
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6. Kent Washburn, "First Quarter Management Project," (an unpublished management project, Baylor University, 1978), pp. 1-4.
7. Sterling D. Hammond. "A Study to Determine a Method for Maintaining Operating Room Capability During Renovation" (unpublished problem solving project, Baylor University, 1978), pp. 39-42.
8. Michael E. Hanlon, "Hospital Follows Two-Phase Plan for Move into New Building," Hospitals, Vol. 52, (March, 1978), pp. 69-72.
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10. Ibid, p. 64.
11. Ibid, P. 65.
12. Newsmouth, "Bellevue's Move - It Approximates the Relocation of a Small City," Modern Health Care, Vol, 4, July, 1975, p. 16.
13. Jerri Abrams, Alfred L. Florman, and Robert S. Holzman, "Infection Surveillance Team Prepares for Move to New Facility," Hospitals, Vol, 54, (April, 1973), p. 74.
14. Kenneth E. Tirmenstein, "Insuring Successful Relocation," Hospital Progress, Vol. 54, (April, 1973), p. 74.

FOOTNOTES

15. Jud H. Knox, "Relocating an Outpatient Service," Hospitals, Vol. 49, (August, 1975), pp. 61-64.
16. William Galvagni, "Planning Facilities Moving Two Hospitals into One New Center," Hospitals, Vol. 50, (February, 1976), p. 63.
17. *Ibid*, p. 64.

CHAPTER II

DISCUSSION

As noted in Chapter I, the decision not to relocate clinics to the Whitside area was dictated by environmental factors, e.g. the deteriorated condition of the buildings and their distant, scattered locations. Irwin Army Hospital, out of necessity, would have to maintain a minimal level of operation in each of the clinics and services affected by the relocation. The hospital must also maintain the capability of expanding the clinic or service functions if medical emergency conditions warranted. This decision to remain operational was the result of command evaluations of alternative methodologies. The feasibility of evacuating or referring patients from the affected clinics to either local civilian hospital or the Department of Defense regional medical centers was not practical. The local civilian communities with their limited medical facilities did not have the expansion capability to absorb an additional 30,000 outpatients per month. Their expansion capacity would not absorb even a fraction of that number even for a very short period. The distance to the DOD regional medical centers was too great to accomodate the numbers of patients involved and the evacuation system too complex and too expensive to support such a program.¹

In light of the constraints and rather inflexible posture that the MEDDAC found itself in at the time of this study, the optional approaches

were limited to two basic alternatives. One alternative was to move all affected functions in a three day period, which would include a week-end, by reducing to a minimal level the services for Friday in the clinics. Staffing would be reduced to a holiday schedule capable of responding to emergency situations, but scheduled patient care would be limited. Each area would utilize both its military and civilian staff on Friday and only the military staff on the weekend to accomplish the relocation. The second alternative was to move one clinic at a time; thereby, staggering the move. This second alternative presented potential for numerous modifications and maximum flexibility for planning processes and the exercise of management discretion. Although numerous variations were considered in an attempt to resolve the relocation problem, only the most flexible and practical options are discussed herein. In designing the problem solving methodology, the intermediate objectives were delineated, the thirty day constraint analyzed, the alternatives were developed, compared, and eventually conclusions and recommendations were formulated. Two basic alternatives and the intermediate objectives will be presented and analyzed in this chapter.

Relocation of Clinics, Services, and Functions

Central Material Supply and the operating room were located in the Phase II construction zone of the second floor of the existing hospital. On the first floor of the hospital were numerous clinic services, clinic service support functions, the hospital headquarters and other primarily administrative areas. The basement included the dining facility, Red Cross, housekeeping, linen services, and maintenance areas. A number of clinics, services, and administrative functions were located in the Whitside area which were to be included in the relocation. Forty-seven

different clinics, services, and functions were identified for relocation. A detailed listing of the elements involved in the relocation appears at Table I. Of the forty-seven relocationg elements, thirty-nine were originally housed within the Phase II construction zone of which thirty-three elements were relocating to the new clinic outpatient addition, four elements were being relocated within the existing hospital structure, and the hospital dental clinic was to relocate outside the hospital to Dental Clinic #4 in the Whitside area. Table I lists the individual, relocating elements, their original location, priority of relocation and their final destination.²

Determination of Relocation Priorities

The location of the surgical suites and Central Materiel Supply within the Phase II construction zone was of primary concern to the command. In the fall of 1979 the surgical suites were moved separately to the renovated labor and delivery suites on the third floor of the existing hospital. To insure an uninterrupted surgical capability, both areas were staffed and operated simultaneously for a limited period of time. Because of the relocation of the surgical suite the Central Materiel Supply was thus separated from the surgical suite. The permanent area in the new outpatient clinic facility will be even further removed from the surgical suites in both the temporary location on the third floor and when they return to the upgraded operating suites on the second floor of the hospital. The Central Materiel Supply was given the highest priority to move in order to allow the contractors immediate access to the second floor area.

TABLE I
Clinics, Services, and Functions Relocation Priorities

Clinic or Service	Location in existing hospital facility	Relocation Site in clinic addition	Priority Classification (See Table II)
Operating Room	2nd Floor	(See Note 1)	1
Central Material Supply	2nd Floor	1st Floor	1
Hospital Headquarters	1st Floor	2nd Floor	2
Chief Professional Services Office	1st Floor	2nd Floor	2
Outpatient Records	1st Floor	1st Floor	2
Inpatient Records	1st Floor	1st Floor	2
Treasurer's Office	1st Floor	1st Floor	2
Comptroller's Office	1st Floor	2nd Floor	2
Adjutant's Office	1st Floor	2nd Floor	2
Central Appointments Services	1st Floor	2nd Floor	2
Primary Care Office	1st Floor	1st Floor	2
Admission & Disposition Office	1st Floor	1st Floor	2
Patient Administration Division	1st Floor	2nd Floor	2
Baggage Room	1st Floor	1st Floor	2
Ambulance Section	1st Floor	1st Floor	3

Clinics, Services, and Functions Relocation Priorities (Continued)

Clinic or Service	Location in existing hospital facility	Relocation Site in clinic addition	Priority Classification (See Table II)
Surgery-Orthopedic Clinics	1st Floor	1st Floor	3
Cast Room	1st Floor	1st Floor	3
Urology Clinic	1st Floor	1st Floor	3
Eye-Ear-Nose & Throat Clinic	1st Floor	2nd Floor	3
Pediatric Clinic	1st Floor	1st Floor	3
Obstetric-Gynecology Clinic	1st Floor	1st Floor	3
Ambulatory Minor Illness Clinic	1st Floor	1st Floor	3
Emergency Treatment Center	1st Floor	1st Floor	3
Radiology	1st Floor	1st Floor	4
Radiology Records	1st Floor & Basement	1st Floor	4
Dispensing Pharmacy	1st Floor	1st Floor	
Pharmacy Storage and Offices	1st, 2nd & 3rd Floors	1st Floor & Basement	4
Blood Donor Center	1st Floor	1st Floor	4
Laboratory Service	1st Floor	1st Floor	4
Dental Clinic	1st Floor	(See Note 2)	6
Chaplain's Office	Basement	2nd Floor	3
Medical Library	Basement	2nd Floor	5
Linen Service	Basement	Basement	5

Clinics, Services, and Functions Relocation Priorities (Continued)

Clinic or Service	Location in existing hospital facility	Relocation Site in clinic addition	Priority Classification (See Table II)
Red Cross Services	Basement	Basement	5
Housekeeping Service	Basement	Basement	5
Special Services Library	Basement	(See Note 1)	6
Mailroom	Basement	(See Note 1)	6
Dining Facility	Basement	(See Note 3)	6
Personnel Division	Building 950	2nd Floor	7
Plans, Operations and Training	Building 966	2nd Floor	7
Occupational Therapy Clinic	Building 953	2nd Floor	7
Optometry Clinic	Building 949	2nd Floor	7
Community Mental Health Activity	Building 948	Basement	7
Physical Exam Center	Building 971	Basement	7
Logistics Division	Buildings 972 thru 995	Basement	7
Well-Woman Clinic	Building 951	1st Floor	7
Immunization-Allergy Clinic	3rd Floor	1st Floor	7

Note 1. Relocated within existing hospital facility.

Note 2. Relocated to Dental Clinic #4, Whitside area.

Note 3. Food preparation facility on Main Post at Ft Riley and dining area on 1st floor of the new clinic addition.

Second level relocation priorities were given to the hospital headquarters and administrative areas in the construction zone of Phase II. This would allow the command to become operational and the administrative support areas to become functional before the clinical areas were involved. Additionally, practical experience would be gained before any attempt was made to relocate direct patient care areas. After the administrative areas were moved, the clinical areas would be relocated. The fourth priority for relocation would be radiology, pathology and the pharmacy. The relocation of these areas would involve the movement of bulky items and/or sophisticated equipment and would require logistical and maintenance support. The next priority for relocation would be given to support services. Some examples of support services are linen and housekeeping. The sixth priority was assigned to those elements that needed to be relocated from the construction zone within the thirty day limitation. These elements would not be relocated to the new clinic addition. These areas were reviewed and it was determined that their relocation would not require the diversion of resources from the primary moves to the outpatient addition.

The last priority was given to relocating of functions from the Whitside complex into the new outpatient clinic addition. These elements would be phased in after the other relocations had been achieved. The thirty day limitation on the relocation is not applicable to the Whitside clinics, services, and functions which would relocate to the new addition. The thirty day limitation only applied to the basement, the first floor, and the second floor operating room area of the existing facility. The relocation of these elements would comprise the Phase II construction zone.

An additional fifteen days were judged by the command as acceptable and sufficient additional time to relocate the Whitside elements into the outpatient clinic area.

Table II summarizes the definition of the priorities for movement of the different elements, whereas Table I indicates the priority of movement assigned to each relocating clinic, service or function. The above priorities were approved by the Transition Committee Meeting on 27 Oct 79.³

Relocation of Equipment and Supplies

There are nearly 500 rooms in the new outpatient clinic addition. The installation of the fixed or built-in furniture and fixtures had been completed as a provision of the original construction contract. The author of the Mount Sinai Hospital relocation article established time frames for six categories of equipment including fixed, built-in, large or heavy moveable equipment, miscellaneous office furnishings, small, expensive or sensitive office and scientific equipment and new supplies.⁴ The new clinic addition contract provided for the first two equipment categories, therefore time frames for these were not established. Nearly 4000 pieces of large, heavy, moveable office furniture and technical equipment need to be prepositioned in the rooms of the outpatient clinic addition. During an interview, SFC James R. Meyer, NCOIC, Construction Project Office, estimated that it would take six or seven days to move the office and other equipment from the Whitside warehouses to the staging area in the logistical warehouse located in the basement of the new addition. Plus, it would take four days to set up the physicians' offices, four days to set up the administrative areas, and six days to set up the patient

TABLE II
Definition of Priority Classifications

<u>Priority Number</u>	<u>Definition</u>
1	Operating room and Central Medical Supply
2	Administrative Elements
3	Clinic areas located in the Phase II construction zone
4	Pharmacy - Laboratory - Radiology
5	Support services in the Phase II construction zone
6	Other elements relocating, but <u>not</u> to the new clinic addition
7	Clinic services and functions relocating to the new clinic addition from areas other than the Phase II construction zone

waiting rooms. These estimates were based on a work force consisting of himself, five temporary civilian employees, and four detail personnel from the Medical Company of the MEDDAC.⁵

In order to achieve the above time frame, the furniture involved was stored in the Whitside area and was segregated by type, e.g. chairs, desks, exam tables, etc. The movement from warehouse to the logistical staging area or bay area of the basement of the new addition would be accomplished by the type of item. Appendix A is a partial listing of those items stored in warehouse Building 941. Lists were prepared to direct the relocation of the equipment to the proper rooms in the new clinic facility. This allowed that items could be unpacked and delivered directly to the rooms in which they were required. This procedure would be repeated with each category of item until all the furniture had been placed in its proper location.

Additional lists, as in Appendix B, were developed showing all items required in a specific room. Those lists would be used to verify the final inventory for each room and would serve as a temporary hand receipt for property accountability.

Approximately 275 pieces of small and/or expensive medical equipment including otoscopes, ophthalmoscopes, scales for height and weight, and wall mounted sphygmomanometers would be installed and inspected by the hospital's biomedical maintenance personnel. In order to accomplish the enormous volume of installations and technical inspections of medical equipment, the workload would have to be phased throughout the transition period in the new addition and it would require a massive commitment of overtime by the military technicians of the biomedical maintenance section.

Each element would be responsible for relocating accessories and miscellaneous furniture and equipment to their new area. Each activity would reduce the volume on hand of expendable supplies to an absolute minimum in that expendable supplies could be immediately drawn upon relocation. Furniture and other hand received items not relocated and for turn-in would remain in place until the activites were operational in the new locations. Excess items would be then moved to an area designated for their consolidation and organization.

Additional Staffing and Equipment

The command desired that any additional temporary-hire personnel would be assigned to the Project Office for supervision and maximum utilization. An analysis of the functions indicated that one temporary employee would have to be able to operate a fork-lift and four additional laborers would be required to load trucks at the warehouses, unload at the logistic staging area, assemble furniture in the rooms of the new addition, and to aid individual elements in their relocation.

A 1 1/2 ton truck would be required daily to haul away trash and four 2 1/2 ton trucks to transport items from their storage location to the new addition. A fork-lift, pick-up truck, two hand trucks and four pallet carts would also be required. This equipment would be justified on the basis of the maximum utilization of the staging area in the logistics section of the basement in the clinic addition to the hospital. These requirements would exist regardless of the occupancy alternative selected. The process of moving the individual functions or services

would mainly involve relocating from a site in the old facility to a new location in the clinic addition. There would only be requirements for additional hand carts and pallets for the internal relocations.

Time Limitations

One of the limitations placed on this study was that any relocation schedule could not involve contract modification, incur additional expense, or cause a delay in the implementation of Phase II, Part A. The contract specified that from final acceptance of the outpatient clinic addition, Irwin Army Hospital had thirty days to transfer to the contractor's control the basement, first floor, and second floor operating room area.⁶ It was estimated that the penalty for delaying the transfer would cost the government a minimum of \$4,000.00 a day. With the cost of overruns on the overall project running substantially over one million dollars, additional costs in the form of government induced delay penalties was not acceptable to the local command, the Corps of Engineers or the Office of the Surgeon General.⁷ Four thousand dollars would purchase the services of at least five laborers for thirty days; therefore the validity of the thirty day limitation cannot be questioned. If the time limitation becomes a critical factor, then it would be more practical to utilize \$4,000.000 to purchase additional resources, e.g. labor, for the relocation than to pay delay penalties.

Stormont-Vail Regional Medical Center Expansion

Stormont-Vail Regional Medical Center in Topeka, Kansas initiated, in early 1978, a fast-track expansion and renovation program. Due to its urban setting, the expansion and renovation was accomplished by demolition

of a portion of the existing hospital and rebuilding on that site. Mr. Stan Regehr, Vice-President of Stormont-Vail Regional Medical Center, was responsible for the construction project. The relocation plan called for staggering the movement schedules so that one floor could be completed and a department moved in before moving another department. Obstetric, radiology, and laboratory services were scheduled to move on consecutive months. In order to maintain 24 hour a day service, despite the transfer of equipment and personnel, services were duplicated in both the new and old locations.⁸

There are some significant differences between management of the construction projects at Stormont-Vail Regional Medical Center and Irwin Army Hospital. Mr. Regehr had under his control and supervision those functions that at Irwin Army Hospital were split between the hospital's Logistics Division, the Post Facility Engineers, the Corps of Engineers, and the Field Project Office of the Office of the Surgeon General. At Stormont-Vail Regional Medical Center the power and the responsibility necessary to achieve the institution's goals had been centralized; therefore, the response time was much quicker. Mr. Regehr had the authority for resource allocation and could add or divert resources as needed, particularly personnel. The construction project was managed using a PERT analysis. Due to the fast-track construction format and the detailed nature and flexibility of the ongoing PERT analysis, the project was consistently meeting or exceeding target dates for completion.⁹

It was observed during the occupancy of the fourth floor of the new bed tower by a 16-bed acute coronary care unit that there was no clear

separation between the ending of contractor's construction efforts and the beginning of the installation of sophisticated medical support and monitoring devices by employees of the hospital or independent vendors. The transfer of a floor or room from the contractor to the institution was piecemeal and did not get delayed awaiting a final acceptance of the total project or building, as was the case with construction for the Army. Five additional employees had been added to Stormont-Vail's employee roster for the relocation period. These additional employees were utilized as laborers and custodial personnel. Additional permanent personnel were added to biomedical maintenance section for the duration of the construction project.¹⁰

The census on the old acute coronary care unit was reduced to a minimum; consequently there were only three patients transferred between the two locations. Privacy curtains and the finishing adjustments were being added to the patient's rooms when they arrived. The final installation of equipment was accomplished that afternoon. The following morning the census had returned to normal.¹¹ The military does not suffer from such intense pressure to convert an area into a revenue producing center.

Two Alternative Relocation Plans

Each clinic, department and service chief was interviewed to determine the amount of time required to relocate their respective functions. Table III, Relocation Time for Clinics, Services, and Functions, summarizes their responses. The mechanics of equipping the outpatient clinic addition would require the first eleven days of any alternative.

TABLE III

Relocation Time for Clinics, Services and Functions

<u>Up to 2 hrs</u>	<u>3-4 hrs</u>	<u>5-6 hrs</u>	<u>7-8 hrs</u>	<u>24 hrs</u>	<u>48 hrs</u>	<u>72 hrs</u>
Ambulance Service 18	Primary Care Office 18	Eyes-Ears-Nose-Throat Clinic 20	Obstetrics and Gynecology 22	Outpatient Records	Central Material Supply 12	Logistics Division 27
Chaplain's Office 33	Ambulatory Minor Illness Clinic 8	Emergency Room 23	Comptroller 16	Inpatient Records	Radiology / Radiology Records 24	Medical Library 18
Red Cross Services 18	Dental Clinic 26	Special Services 18	Central Appointments Services 18	Treasurer's Office	Occupational Therapy 30	
		Library 18	Patient Services 18	Baggage Room		
	Mail Room 17	Dining Facility 34	Admissions	Admissions		
	Immunization/ Allergy Clinic 18		Disposition Office 15	Disposition Office 15		
	Headquarters 13	Plans, Operations and Training Office 29	Patient Administration Division 15	Pharmaceutical Dispensary, Pharmacy, Storage areas and offices 18		
	Chief of Professional Services 14	Physical Exam Center 18	Surgery/Orthopedics/Urology/ Casts 19			
	Adjutant's Office 17		Linen Service 27	Blood Donor Facility		
	Pediatric Clinic 21		Optometry Clinic 31	Laboratory Services 25		
	Well-Woman Clinic 18		Community Mental Health Services 32	Housekeeping Services 27		
			Personnel Office 18			

An alternative would be to reduce the outpatient work load on a Friday and to attempt to relocate the 33 elements from the Phase II, Part A, construction zone to the outpatient clinic over a three day period, e.g. Friday, Saturday and Sunday. After all elements have relocated from the construction zone then the elements from areas outside the construction zone and from the Whitside area would relocate on the following Friday, Saturday and Sunday.

Another alternative is summarized by Table IV, Master Time Table for Relocation, which would stagger the times for the relocation of the clinics, services, and functions. This alternative would allow for a five day buffer zone at the end of the 30 day period before the elements from areas outside the construction zone and from the Whitside area would be phased into the relocation plan.

Both alternatives would meet the criteria established for the relocation plan as described in Chapter 1 of this problem solving study, e.g., being continuously operational and remaining within the cost constraints. Neither alternative would provide for the occupancy of one floor at a time, but the second alternative, delineated in the Master Time Table for Relocation, would minimize the number of elements moving to any floor at any given time. Between the existing hospital and the new clinic addition, there was only one connecting hallway on each floor; therefore, the potential for bottlenecks was greater in the alternative calling for the relocation of thirty-three elements over a Friday, Saturday and Sunday.

TABLE IV

MASTER TIMETABLE FOR RELOCATION

Element	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<u>Logistical Support</u>																
Biomedical maintenance installation of equipment																
Transfer of furniture and equipment from warehouse																
Set-up of Administrative Areas																
Set-up of Physicians' Offices																
<u>2nd Floor Occupancy</u>																
Hospital Headquarters																
Adjutant's Office																
Chief, Professional Services Office																
Comptroller's Office																
Central Appointments System																

TABLE IV (Continued)

MASTER TIMETABLE FOR RELOCATION

Element	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<u>1st Floor Occupancy</u>																
Central Materials Supply																
Outpatient Records																
Inpatient Records																
Treasurer's Office																
Baggage Room																
Admission and Disposition Office																

33a

TABLE IV (Continued)
MASTER TIMETABLE FOR RELOCATION

Element	Day	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
<u>Logistic Support</u>																
Biomedical Maintenance																
Installation of equipment																
<u>2nd Floor Occupancy</u>																
Patient Administration Division																
Eye, Ear, Nose and Throat Clinic																
Chaplain's Office																
Medical Library																
<u>1st Floor Occupancy</u>																
Emergency Treatment Center																
Ambulance Section																
Surgery-Orthopedic Clinic																
Urology Clinic																
Cast Room																

TABLE IV (Continued)

MASTER TIMETABLE FOR RELOCATION

Element	Day	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
<u>1st Floor Occupancy</u>																
Obstetrics and Gynecology																
Pediatric Clinic																
Ambulatory Minor Illness Clinic																
Primary Care Office																
Dispensing Pharmacy																
Pharmacy Storage and Offices																
Radiology																
Radiology Records																
Laboratory Service																
Blood Donor Center																
Dining Facility																
<u>Basement Occupancy</u>																
Red Cross Services																

TABLE IV (Continued)
MASTER TIMETABLE FOR RELOCATION

Element	Day	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Linen Services																
Housekeeping Service																
<u>Elements not relocating to the new addition</u>																
Mailroom (to 2nd Floor existing facility)																
Special Services Library (to 3rd Floor existing facility)																
Dental Clinic (to Dental Clinic #4)																

TABLE IV (Continued)
MASTER TIMETABLE FOR RELOCATION

Element	Day	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
<u>Logistics Support</u>																
Biomedical Maintenance																
Installation of equipment																
<u>2nd Floor Occupancy</u>																
Optometry Clinic																
Occupational Therapy Clinic																
Personnel Division																
Plans, Operations and Training																
Logistics Division																
<u>1st Floor Occupancy</u>																
Immunization/Allergy Clinic																
Well-Woman Clinic																
Physical Exam Center																
Community Mental Health Activity																

FOOTNOTES

1. Thomas L. Luzier, "Riley and Geary County MASCAL Expansion Capability" (an unpublished study, U.S. Army, 1978), pp. 1-3.
2. Department of Army Form 2496, Concept of Transition Plan, dated 27 October 1978.
3. Ibid.
4. Michael M. Schwartz, "Three Years of Strategy Smooth Occupancy of New Hospital Building," Hospitals, Vol 51 (May, 1977), p. 64.
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7. Interview with James L. Newborn, MAJ. Project Office, Health Facility Planning Office, Office of the Surgeon, Ft Riley, Kansas. 23 November 1978.
8. C. Jerome Jorgensen. "Stormont-Vail Hospital Expansion Program", Today, Summber, 1977, p. 3.
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10. Interview with Stan Regehr, Vice-President, Stormont-Vail Regional Medical Center, Topeka, Kansas. 12 January 1979.
11. Ibid.
12. Interview with Joyce T. Springmier, LTC. Chief, Operating Room Nurse, Irwin Army Hospital, Ft Riley, Kansas. 19 October 1978.
13. Interview with Frank F. Ledford Jr., COL. Commander, Medical Department Activity, Irwin Army Hospital, Ft Riley, Kansas. 2 October 1978.
14. Interview with Byron B. Alexander, LTC. Chief of Primary Care and Community Medicine, Irwin Army Hospital, Ft Riley, Kansas. 10 October 1978.
15. Interview with James O. Walker, LTC. Chief, Patient Administration Division, Irwin Army Hospital, Ft Riley, Kansas. 13 October 1978.

16. Interview with Ramon E. Eller, Comptroller, Irwin Army Hospital, Ft Riley, Kansas. 20 October 1978.
17. Interview with William C. Howland, CPT. Adjutant, Irwin Army Hospital, Ft Riley, Kansas. 20 October 1978.
18. Interview with Sterling D. Hammond, MAJ. Associate Administrator, Chief of Professional Services, Irwin Army Hospital, Ft Riley, Kansas. 18 October 1978.
19. Interview with Thomas A. Hawkes Jr., LTC. Chief, Orthopedic Services, Irwin Army Hospital, Ft Riley, Kansas. 10 October 1978.
20. Interview with Craig D. Weeks, MAJ. Chief, Ophthalmology Services, Irwin Army Hospital, Ft Riley, Kansas. 10 October 1978.
21. Interview with Thomas L. Luzier, MAJ. Chief, Department of Medicine, Irwin Army Hospital, Ft Riley, Kansas. 19 October 1978.
22. Interview with Granville Phillips Jr., MAJ. Obstetrician, Irwin Army Hospital, Ft Riley, Kansas. 9 October 1978.
23. Interview with Margaret K. Swanson, CPT. Clinical Head Nurse, Emergency Medical Treatment Center. Irwin Army Hospital, Ft Riley, Kansas. 13 October 1978.
24. Interview with Daniel E. Schowengerdt, CPT. Chief, Inpatient and Ancillary Care Branch. Irwin Army Hospital, Ft Riley, Kansas. 9 October 1978.
25. Interview with David C. Helseth, CPT. Clinical Laboratory Officer, Irwin Army Hospital, Ft Riley, Kansas. 16 October 1978.
26. Interview with Floyd D. Metzger, COL. Chief, Department of Dentistry, Irwin Army Hospital, Ft Riley, Kansas. 12 October 1978.
27. Interview with Charles B. Rizer, LTC. Chief, Logistics Division, Irwin Army Hospital, Ft Riley, Kansas. 12 October 1978.
28. Interview with Donn C. Jones, LTC. Chief, Personnel Division, Irwin Army Hospital, Ft Riley, Kansas. 9 October 1978.
29. Interview with Kerry L. Little, CPT. Chief, Plans, Operations and Training, Irwin Army Hospital, Ft Riley, Kansas. 3 October 1978.
30. Interview with Daryl D. Cunningham Jr., CPT. Chief, Occupational Therapy, Irwin Army Hospital, Ft Riley, Kansas. 9 October 1978.
31. Interview with Norman L. Burris, LTC. Chief, Optometry Services, Irwin Army Hospital, Ft Riley, Kansas. 10 October 1978.

32. Interview with James E. Sexton, SFC. Behavioral Science Non-Commissioned Officer, Irwin Army Hospital, Ft Riley, Kansas. 12 October 1978.
33. Interview with Arnold McFarlane, LTC. Hospital Chaplain, Irwin Army Hospital, Ft Riley, Kansas. 4 October 1978.
34. Interview with Clorice D. Thomas, MAJ. Chief, Food Service Division, Irwin Army Hospital, Ft Riley, Kansas. 17 October 1978.

CHAPTER III

Conclusions

The ultimate goal of this study has been to develop an optimal occupancy schedule for the new outpatient clinic addition to Irwin Army Hospital. This plan must minimize the potential adverse impact that the relocation would have on the provision of outpatient medical care at Fort Riley, Kansas. An analysis of the findings of this study resulted in the following conclusions being offered:

1. The command imposed realistic constraints on the relocation, and a number of alternative schedules could be developed within the constraints.
2. The need for middle management involvement in all stages of planning for the relocation was essential for minimizing the adverse impact on patient care. The vehicle for achieving that involvement at Irwin Army Hospital existed in the Transition Committee.
3. The system developed by the Project Office to equip the new clinic addition was efficient, timely and involved only a very small number of staff personnel. The system would allow for maximum and immediate utilization of areas as they were occupied.
4. The volume of work to be accomplished by the biomedical maintenance personnel would require detailed management by the Chief, Logistics Division. Close coordination with the supervisor of the relocating elements by the Chief, Logistics Division would be necessary in order to insure the timely installation of required medical equipment.

5. Evaluation of the most feasible alternatives for the occupancy of the new outpatient addition resulted in the selection of the optimum relocation schedule which was outlined in Table IV, the Master Timetable for Relocation. Maximum management flexibility and discretion would be maintained by that alternative while minimizing the potential of adverse impact on outpatient care.

CHAPTER IV

Recommendations

Based upon the conclusions offered above, plus the ancillary findings of the study, the following recommendations are offered:

1. The Transition Committee would coordinate the relocation with particular emphasis on the biomedical maintenance aspects, develop a plan and assign responsibility for documenting the actions, reactions, and coordination required. Inherent in this documentation would be a process for evaluation of the system not only as it was implemented but following full implementation as well.
2. The Master Timetable for Relocation would be adopted and modified upon notification of the final acceptance of the new outpatient clinic addition. In this way, the five day buffer zone could be redistributed throughout the schedule to minimize the number of military personnel required to work on weekends.
3. An active public relations campaign would be implemented to inform the population served of the anticipated relocation schedule and its affects upon the availability of outpatient services. The public relations campaign would use the opportunity to enhance the image of Irwin Army Hospital by outlining the improvements being made in patient services.
4. A committee would begin planning a formal dedication to celebrate this significant benchmark in the history of the practice of medicine and the Army Medical Department at Fort Riley, Kansas.

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